

**METHOD FOR FABRICATING A THIN-MEMBRANE STENCIL  
MASK AND METHOD FOR MAKING A SEMICONDUCTOR DEVICE  
USING THE SAME**

5

Abstract of the Disclosure

A stencil mask (12 or 12') has both a thin membrane layer (106) and a stress controlled layer (104) for enabling electron and ion projection lithography at very small geometries. The thin membrane layer (106) is within

- 10 a range of substantially forty to two hundred nanometers and is preferably silicon nitride, and the stress controlled layer is preferably a metal or a metal alloy. Annealing of the stress controlled layer (104) may be performed to obtain a desired stress characteristic. Semiconductors are made using the mask by projecting radiation through the thin membrane stencil mask and reduction optics (30) onto resist (44) formed on a plurality of die, the radiation forming a contrast image on the resist that is subsequently developed. Commercially available lithography equipment is compatible with the thin stencil mask.
- 15